CLAIMS

1.   A speech processing apparatus comprising:

a data store operable to store a plurality of word

5   models;

a receiver operable to receive an utterance; and

a matching unit operable to determine which of a

plurality of word models stored in said data store most

closely matches an utterance received by said receiver,

10   said matching unit being arranged to output a value

indicative of the goodness of each match between a most

closely matching word model and an utterance received by

said receiver;

characterized by further comprising:

15   a confidence model store operable to associate each

word model stored in said data store with data indicative

of the probability of a said value indicative of the

goodness of match being output if said word model

correctly or incorrectly matches an utterance; and

20   a confidence score output unit operable to determine

and output a confidence score indicative of a calculated

posterior probability that a received utterance has been

correctly matched to a word model given that the match

resulted in the output of a particular value indicative

25   of goodness of match, said output unit being arranged to

calculate said confidence score for a match utilizing said value output by said matching unit and said data associated with the word model matched to utterances by said confidence model store.

2.   Apparatus in accordance with claim 1, wherein said matching unit is arranged to output a plurality of values indicative of the goodness of a match, wherein said confidence model store is arranged to associate data indicative of the probability of each of said output values being output, and wherein said output unit is arranged to calculate said confidence scores for matches utilizing said plurality of output values and said data associated with word models by said confidence model store.

3.   Apparatus in accordance with claim 1, wherein said matching unit is arranged to determine match scores indicative of the correspondence between an utterance and word models, and output as a value indicative of the goodness of a match of the match score for the most closely matching word model.

4.   Apparatus in accordance with claim 3, wherein said matching unit is arranged to output as a value indicative

of the goodness of a match, data indicative of the ratio
of a match score indicative of the correspondence between
an utterance and a most closely matching word model and
a match score for the correspondence between an utterance
and a different word model.

5.   Apparatus in accordance with claim 4, wherein said
different word model comprises the second most closely
matching word model to an utterance.

6.   Apparatus in accordance with claim 4, wherein said
different word model comprises the most closely matching
word model to an utterance that is representative of a
different word to said most closely matching word model.

7.   Apparatus in accordance with claim 1, wherein said
confidence model store is arranged to associate the same
data with all word models stored within said data store.

8.   Apparatus in accordance with claim 1, wherein said
confidence model store is arranged to associate different
data with different word models stored within said data
store.

9.   Apparatus in accordance with claim 8, wherein said

confidence model store is arranged to associate groups
of word models stored in said data store with different
data.

5   10. Apparatus in accordance with claim 1, wherein said
confidence model store is arranged to associate with each
word model data defining a probability density function
of the probabilities of a said value being output if said
word model correctly or incorrectly matches an utterance.

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11. An apparatus in accordance with claim 10, wherein
said data defining a probability density function
comprises data defining a function type and a one or more
parameters.

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12. An apparatus in accordance with claim 10, wherein
said output unit is arranged to determine probabilities
that a value indicative of goodness of match would be
output if a word is correctly or incorrectly matched
20   utilizing said data defining probability functions
associated with a matched word and to utilize said
determined probabilities to calculate said confidence
score.

25   13. An apparatus in accordance with claim 1, wherein

said confidence model store is further arranged to associate with word models data indicative of the probability of word models being correctly or incorrectly matched to any utterance, wherein said output unit is

5　　arranged to utilize said data to calculate said confidence score.

14. A method of generating data for association with word models stored within a speech processing apparatus

10　　in accordance with claim 1, the method comprising the steps of:

determining for each utterance in a test vocabulary of known words, word models matched to said test utterances and said values output by said matching unit;

15　　for utterances correctly matched to known words in said test vocabulary, determining a function corresponding to the probability of said values indicative of goodness of match arising;

for utterances incorrectly matched to known words

20　　in said test vocabulary, determining a function corresponding to the probability of values indicative of goodness of match arising; and

outputting data representative of said determined functions.

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15. A method in accordance with claim 14, further comprising the steps of determining the proportion of utterances correctly or incorrectly matched to a word model and outputting data representative of the

5   probability of a word model being correctly or incorrectly matched.

16. A method in accordance with claim 14, wherein said determination steps are performed for each word model

10   stored in said speech processing apparatus and data is output for association with each of said models.

17. A method in accordance with claim 14, wherein said determination steps are performed for each word model

15   stored in said speech processing apparatus representative of words of selected lengths and data is output for association with groups of models representative of words of said selected lengths.

20   18. A method in accordance with claim 14, further comprising the step of:

storing said output data in association with word models stored within a speech processing apparatus.

25   19. A method in accordance with claim 18, further

comprising the steps of:

for a set of test utterances representative of known words, utilizing said speech processing apparatus to determine for said set of test utterances, a set of matched word models and output confidence scores;

for word models matched to test utterances determining the difference between the sum of confidence scores for utterances matched to each said word model and the number of utterances correctly matched to said word model; and

generating further data for association with a word model if said difference is greater than a predetermined proportion of said test utterances matched to said word model.

20. A method of speech processing comprising the steps of:

storing a plurality of word models;

associating each word model with data indicative of the probability of a value indicative of the goodness of a match being calculated if said word model correctly or incorrectly matches an utterance;

receiving an utterance;

calculating a value indicative of the goodness of the match between a most closely matching word model of

said plurality of word models and the received utterance; and

determining and outputting a confidence score indicative of a calculated posterior probability that a received utterance has been correctly matched to a word model given that the match resulted in the calculation of said value indicative of goodness of match utilizing said value and said data associated with said word model.

21. A method in accordance with claim 20, wherein a plurality of values indicative of the goodness of a match are calculated, said associating step comprising associating for each word model with data indicative of the probability of each of said values being calculated if said word model correctly or incorrectly matches an utterance and wherein said confidence score is calculated utilizing said plurality of calculated values and said data associated with said word models.

22. A method in accordance with claim 20, wherein said calculated value indicative of the goodness of the match comprises a determined match score indicative of the correspondence between a received utterance and a stored word model.

23. A method in accordance with claim 20, wherein said calculated value indicative of the goodness of a match comprises data indicative of the ratio of a match score indicative of the correspondence between an utterance and a most closely matching word model and a match score for the correspondence between an utterance and a different word model.

24. A method in accordance with claim 23, wherein said different word model comprises the second most closely matching word model to an utterance.

25. A method in accordance with claim 23, wherein said different word model comprises the most closely matching word model to an utterance that is representative of a different word to said most closely matching word model.

26. A method in accordance with claim 20, wherein said association step comprises the step of storing data indicative of probability density functions of a value being output if a said word model correctly or incorrectly matches an utterance.

27. A recording medium storing computer implementable processor steps for generating within a programable

computer an apparatus in accordance with any of claims 1 to 13 or for causing a programable computer to perform a method in accordance with any of claims 20 to 26.

28. A recording medium in accordance with claim 27, comprising a computer disc.

29. A computer disc in accordance with claim 28, wherein said computer disc comprises an optical, a magneto-optical or magnetic disc.

30. A recording medium in accordance with claim 28, comprising electric signal transferred via the Internet.

31. A speech processing apparatus comprising:

storage means for storing a plurality of word models;

receiving means for receiving an utterance; and

matching means for determining which of a plurality of word models stored in said storage means most closely matches an utterance received by said receiving means, said matching means being arranged to output a value indicative of the goodness of each match between a most closely matching word model and an utterance received by said receiving means;

characterized by further comprising:

association means associating each word model stored in said storage means with data indicative of the probability of a said value indicative of the goodness of match being output if said word model correctly or incorrectly matches an utterance; and

determining means for determining and outputting a confidence score indicative of a calculated posterior probability that a received utterance has been correctly matched to a word model given that the match resulted in the output of a particular value indicative of goodness of match, said determining means being arranged to calculate said confidence score for a match utilizing said value output by said matching means and said data associated with the word model matched to utterances by said association means.